CLAIMS

What is claimed is:

1. An image reading apparatus for reading an image which contains character information, the apparatus comprising:

labeling process unit to group a continuous black pixel area forming characters contained in a read two levels of black and white monochrome image of two levels, and extracting group bounding rectangle information about a grouped continuous black pixel area;

row extracting process unit to extract row rectangle information from position information about a group bounding rectangle of the continuous black pixel area extracted and grouped by the labeling process unit;

punctuation mark identification unit to identify a punctuation mark, a period, or a comma from a position and a size of the continuous black pixel area grouped by the labeling process unit; and

row direction determination unit to determine a direction of a row from a position relationship among a punctuation mark, a period, or a comma in a row rectangle of characters contained in an image.

2. The image reading apparatus according to claim 1, further comprising:

binarizing process unit to binarize multi-valued image data when image data of a multi-valued image is read by an image input device.

3. The image reading apparatus according to claim 2, further comprising:

statistical determination process unit to determine a direction of a row by the row direction determination unit for a plurality of rows, and determining a direction having a higher probability of a direction of a row as a direction of an original in a statistical process.

4.   The image reading apparatus according to claim 1, further comprising:

statistical determination process unit to determine a direction of a row by the row direction determination unit for a plurality of rows, and determining a direction having a higher probability of a direction of a row as a direction of an original in a statistical process.